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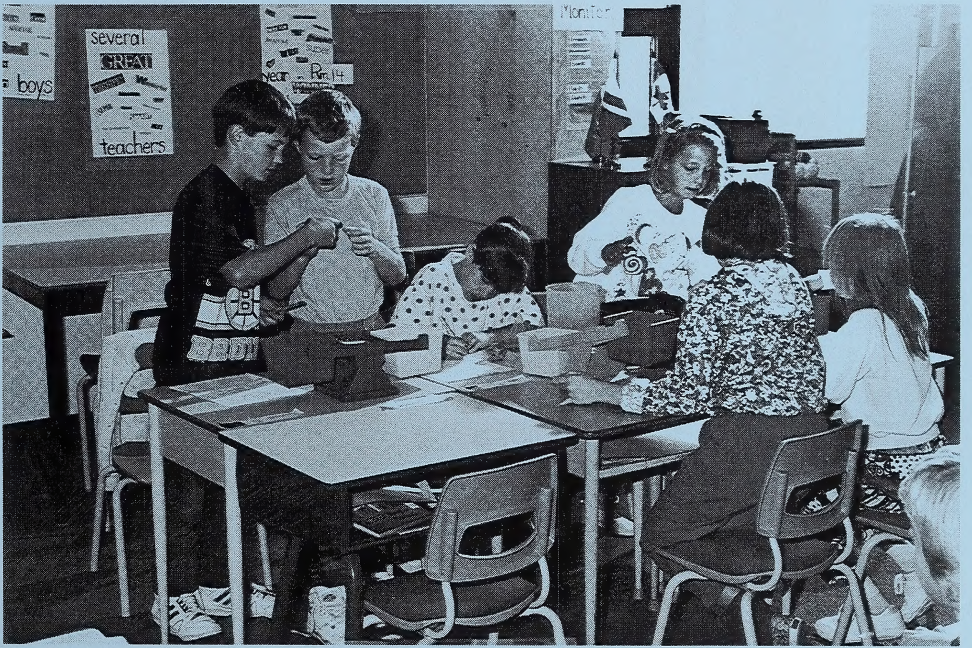
Assessment Highlights

Grade 3 Mathematics



June 1995

Students First!
Student Evaluation

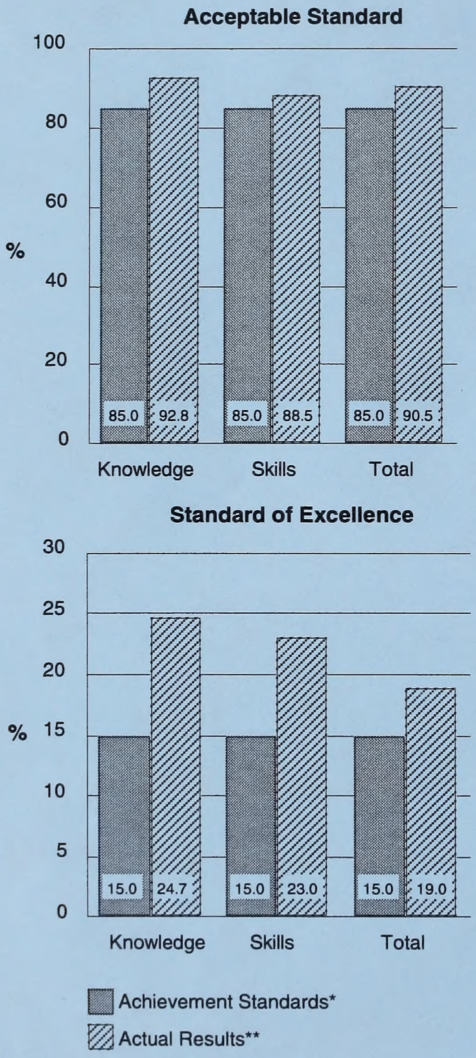
Alberta
EDUCATION

Assessment Highlights

Grade 3 Mathematics

This report provides teachers, school administrators, and the public with an overview of the results for the June 1995 Grade 3 Mathematics provincial assessment. It complements the detailed school and jurisdiction reports.

Percentage of Students Meeting:



*the percentage of students in the province expected to meet the acceptable standard and the standard of excellence

**the percentage of students in the province who met the standards (based on those who wrote)

Who Wrote the Test?

All students registered in Grade 3 were expected to write the 1995 Mathematics Achievement Test. A total of 40 406 students completed the June 1995 test. This number reflects a decrease of approximately 620 students from the last administration of the test in 1994. In 1995, only a small proportion of students in Grade 3 did not write the test: 1.7% of students were absent and 2.0% of students were excused from writing by their superintendent.

What Was the Test Like?

The test consisted of two sections.

Section One had 50 questions integrated in a three-part narrative. Five strands were assessed: Numeration, Operations and Properties, Measurement, Geometry, and Graphing. The questions were classified in two reporting categories: Knowledge and Skills.

Section Two had two timed tests of number facts in addition and subtraction. Students were given 2 minutes to complete each operation. It was administered to a sample population.

How Well Did Students Do?

The results presented in this report are based on scores achieved by all students except those in the Francophone Program. Results for students in the Francophone Program are reported separately. Students' overall performance in Grade 3 Mathematics was better than expected.

In 24% of the schools, the percentage of students meeting the acceptable standard was significantly above expectations for the province. In 67.1% of the schools, the percentage of students meeting the acceptable standard was not significantly different from provincial expectations. In 8.9% of schools, the percentage of students meeting the acceptable standard was significantly below provincial expectations. Schools where fewer than five students wrote the grade 3 test are not included in these calculations.

Detailed provincial test results are provided in school and jurisdiction reports.

Has Achievement Changed Over Time?

A study of changes in achievement was conducted as part of the provincial assessment. Results show a small improvement in achievement.

Test Blueprint

Each question on the blueprint is classified according to its assessment component and learning domain. The blueprint shows the distribution of questions according to these classifications.

Strands	Reporting Category* Knowledge	Reporting Category* Skills	Total Number of Questions
Numeration	15, 16, 23, 38, 48	4, 11, 21, 27, 29, 32, 35, 40, 41	14
Operations and Properties	9, 24, 36, 44	5, 6, 7, 8, 17, 18, 22, 30, 31, 42, 45, 50	16
Measurement	20, 25, 46	1, 2, 12, 13, 19, 37, 39	10
Geometry	14, 26, 43	10	4
Graphing	28, 34, 47	33, 49	5
Total	18	31	49

*Question #3 was dropped (See Comments Section)

Test Review

The Grade 3 teachers who reviewed and set standards for the test felt that it was a good reflection of the mathematical knowledge and skills that students are expected to demonstrate by the end of Grade 3. Test emphases were on interpreting concrete, pictorial, and symbolic modes to demonstrate understanding and on understanding concepts and applying them in context, using meaningful situations.

Observations and Sample Questions

Sample questions from the test and accompanying discussion are provided to highlight the strengths and weaknesses of students meeting the acceptable standard and the standard of excellence. For each sample question, there is an asterisk (*) beside the correct answer.

Use this information to answer questions 5 and 6.

Tony's Pizza has 8 tables and 32 chairs. I saw 18 chairs with people sitting in them.

5. **How many chairs are empty?**

○ 40
○ 26
○ 24
*○ 14

6. Each table has the same number of chairs.

How many chairs are at each table?

○ 3
*○ 4
○ 5
○ 6

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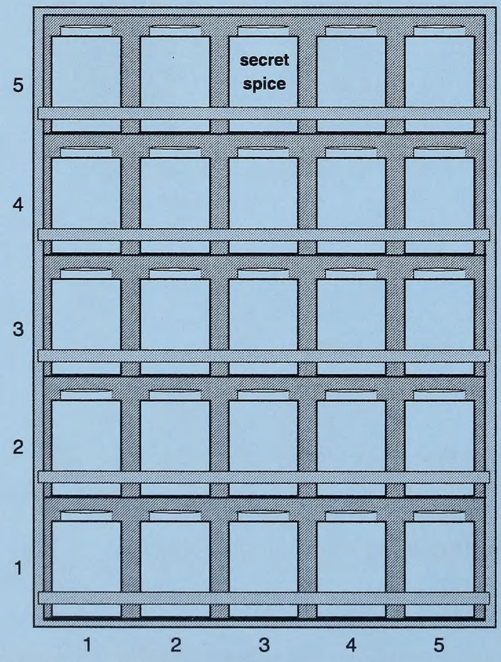
28. Tony put the secret spice in his spice rack.



The secret spice is located

○ across 2, up 4
○ across 5, up 3
*○ across 3, up 5
○ across 4, up 2

Acceptable Standard

For **question 5,** students were required to identify the needed information and then use subtraction with regrouping to solve the problem. A little over 81% of the students meeting the *acceptable standard* could do this.

For **question 6,** students were required to recognize an equal sharing situation and to divide accurately. Almost 80% of the students who met the *acceptable standard* could do this.

For **question 28,** students were required to identify and recognize the correct location on a grid. A little over 67% of the students meeting the *acceptable standard* could do this. This question was clearly more challenging than the other two for the students meeting the *acceptable standard.*

Overall, the strengths of students who met the *acceptable standard* include the ability to

- interpret pictorial representations of numerals to standard notation
- read thermometers to one-degree intervals
- identify net for a closed box
- determine the value of sets of coins
- use ordinals or cardinals to find positions
- relate number sentences to pictorial representations
- use calendars
- recognize pictorial representations of fractions and decimals
- understand the concept of half
- recognize instruments used for measuring
- identify 2 and 3-dimensional figures
- recognize counting patterns of 5
- read graphs and charts
- recognize equal sharing situations (question 6)
- perform operations with one regrouping (question 5)

21. Invitations are sold in boxes of 10.

Tony and I decide to invite 28 people.

How many BOXES of invitations should we buy?

O 10
O 5
*O 3
O 2

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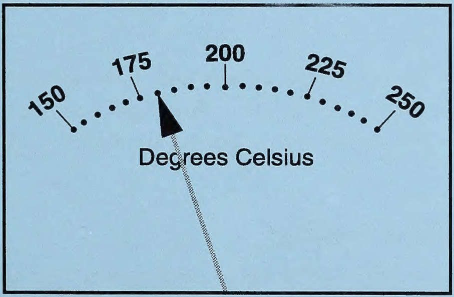
27. Tony is ready to bake the pizza.

The oven temperature must be 210°C to bake pizzas.



How many degrees must the oven temperature rise before Tony can bake the pizzas?

*O 30°
O 40°
O 150°
O 170°

The difficulties the students experienced were in the ability to

- express equivalency using more than, less than, equal to
- subtract 3-digit numbers with regrouping
- use less than when counting sets of 10
- recognize a needed operation to solve a problem
- estimate height in meters
- interpret information on charts to solve problems
- identify 4-digit numerals from written word form
- identify a position on a grid (question 28)

Standard of Excellence

For **question 21,** students were required to count by 10's and to consider the number 28 and understand the need for 30. Nearly 98% of the students who met the *standard of excellence* could do this.

For **question 27,** students were required to identify the temperature on the thermometer and to recognize the scale used. Then they could count by 5 or subtract to reach the new temperature. About 88% of the students who met the *standard of excellence* could do this.

Students who met the *standard of excellence* had few difficulties with this assessment. Their strengths were in their ability to

- convert numbers from one form of notation to another.
- use any of the operations to solve problems
- use visualizations, estimations, or measurements in problem solving
- interpret information on graphs or charts to solve problems

Comments

Dropped Questions

Question 3 on the 1995 test was dropped as a result of an error in the diagram. As a result, all calculations and statistics were based on 49 questions, not 50 questions.

Story-Line Context

Information received from teachers and parents indicates that having a story line on the Grade 3 Mathematics test is viewed as being positive, making the test more interesting and "fun" for the students. A concern has been expressed, though, about the readability of the story line and the need to keep it simple and basic. Every effort is being made through ongoing reviews to maintain an appropriate reading level for the end of the year Grade 3 Mathematics assessment.

Number Facts

In 1995, a random sample of Grade 3 students throughout the province was tested on basic addition and subtraction number facts. Results will be sent out at a later date. A copy of the number facts tests and the standards has been sent out to all school in June 1995. Grade 3 classroom teachers are encouraged to use them as needed in their own assessments.

Resolving Administration Anomalies

Although we announced the new practice of reusing items from 1992, 1993, or 1994 tests, and the securing of these tests as late as October 1994, most schools were able to respond quickly and were successful in avoiding the use of these tests with students. Consequently, the 1995 testing was conducted effectively throughout Alberta without compromising the validity of the results. In a few schools, however, questions were raised about students' prior access to the test items and concerns were rightfully expressed about fairness and accuracy. Superintendents were asked to investigate, along with school principals and teachers, these and all other non-standard testing practices brought to our attention and to make recommendations about the validity of results. Initially, 213 student results for Grade 3 Mathematics were reported as "not available," pending further investigation due to validity concerns. In the end, no results were determined to be invalid for Grade 3 Mathematics.

Release of Secured Items

As outlined in the General Information Bulletin, items from the achievement tests are secured except those that are released each year in the subject area bulletins. The items in these bulletins may be used to prepare students for the provincial assessment. The subject area bulletins are mailed to all schools in the fall.

Parent Guide to Provincial Achievement Testing

Last spring, we sent to schools copies of the *Parent Guide to Provincial Achievement Testing* to distribute to parents through the students in grades 3, 6, and 9. The purpose was to support open communication about provincial standards and the testing program among the teacher, the student, and the parent. The guide included a tear-out card with several questions and space for comments. Parents returned over 2000 cards; about half included comments. Parents' feedback about the learnings expected of students, the quality of questions on the tests, and the testing program was generally positive. Their written comments ranged from positive to negative, and many simply asked for more information. As parents seemed to appreciate this form of communication, we are looking for a way to make the guide available again later this school year.

Performance-Based Assessment

In addition to the Achievement Test, a random sample of students from across the province participated in performance-based assessments in **Language Arts 3**, **Mathematics 6**, and **Social Studies 9.**

Performance-based assessment reports will be sent to participating schools. A "*Samples of Student Responses*" document for the performance-based assessment will be prepared and made available to all schools in the Spring of 1996.

1995 Administration—A Note of Thanks

We at Student Evaluation wish to express our appreciation to you, the principals and teachers throughout Alberta, for the care and attention you gave to the administration of the 1995 achievement tests. Successful implementation of the expanded program and the changes in procedures and rules depended on your assistance and cooperation. We hope that you find the changes in the testing and the additional achievement information helpful in your work with students.

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For further information, contact Phyllis Kozak, Grade 3 Assessment Specialist or Dennis Belyk, Assistant Director at 403-427-0010. The toll-free number is 310-0000.

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